

# **Weather, Water and Climate Services**

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**Overview**





# NOAA Research and Services: Understanding Relationships

- Science is the foundation for all of what NOAA does.
- Services are at the heart of NOAA's mission.
- **Research builds the scientific foundation.**
- **Research also builds science-services connections.**

Two important attributes for creating effective services are:

- **Responsiveness** – understanding current needs (user pull)
- **Innovation** – anticipating future needs (research push)



# Research-Service Drivers

- **NOAA's goals** (e.g., Climate, Weather and Water), mission requirements.
- **Needs of existing NOAA services** (our primary customers). Are there critical service gaps that we can address?
- **Needs of emerging NOAA services** – the NOAA Climate Service.
- **National imperatives** - National needs for information relevant to climate change adaptation and mitigation, water, energy, etc.
- **Public and decision-maker needs** - Can drive innovation.
- **Scientific advances** – breakthroughs and surprises.



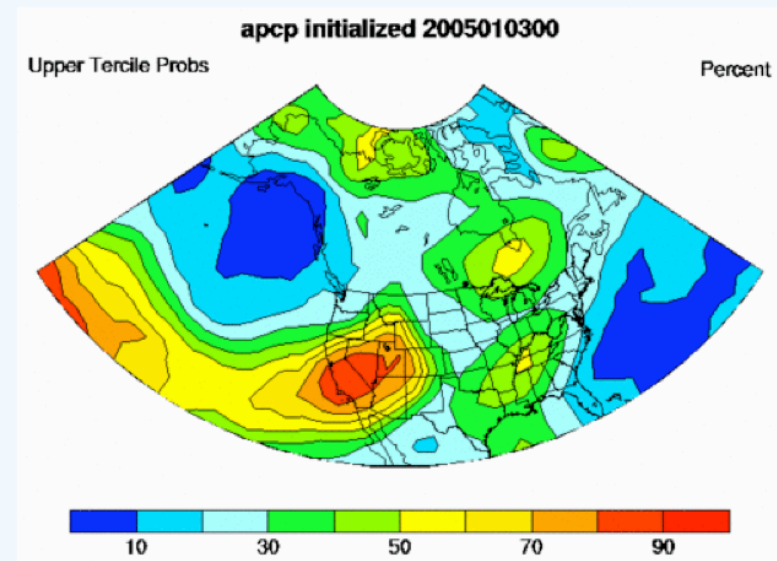
# A NOAA Service Need

- The research driver: NWS requirement for improved “week two” forecasts
- Improvement required innovation – “Reforecasting” (see Hamill poster)
- Method led to major skill advances (~ 1-2 day lead-time improvements)

**This research did more than transition to operations: it *transformed* operations.**



La Conchita flood/landslide 01/12/05



6-10 day forecast using Reforecast Method



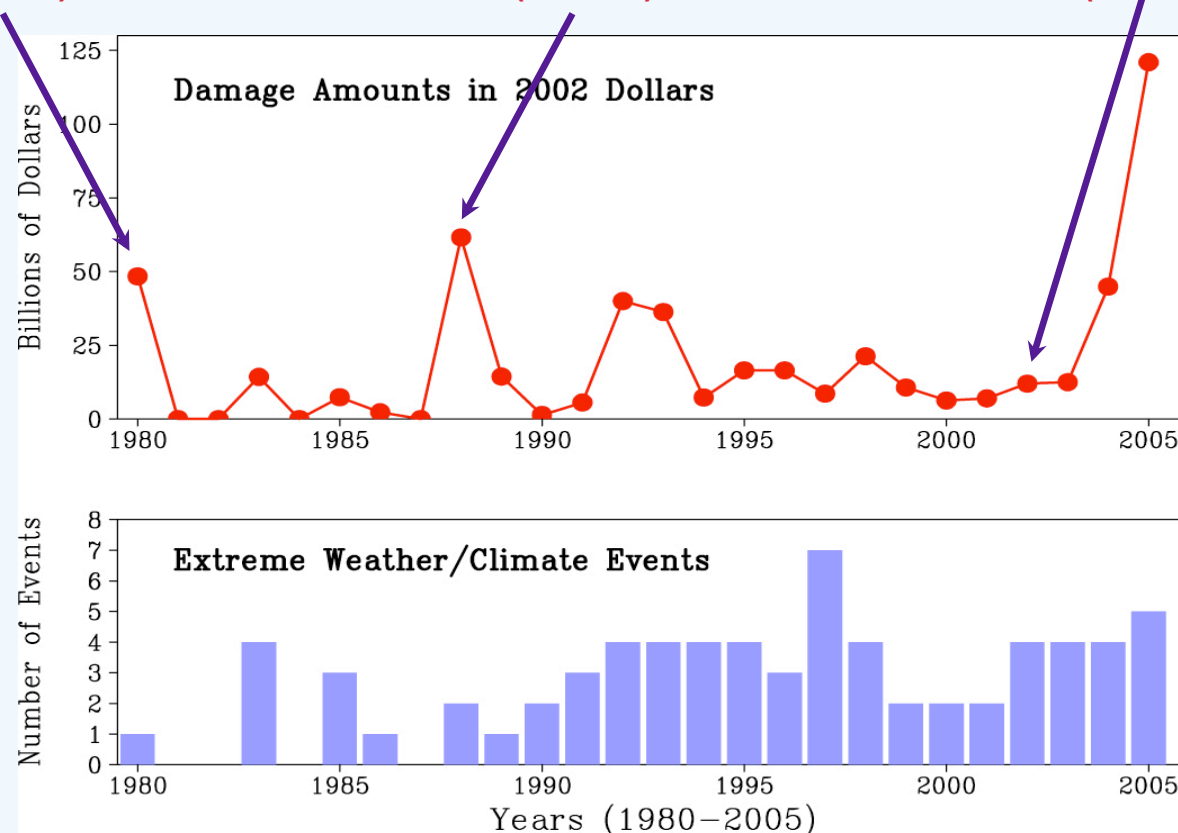
# A National Need: Improved Drought Information

Annual average U.S. drought-related losses are several billion dollars.

**1980 Drought  
(\$48.4B)**

**1988 Drought  
(\$61.9B)**

**2002 Drought  
(\$10.0B)**







# Compelling Regional Issues

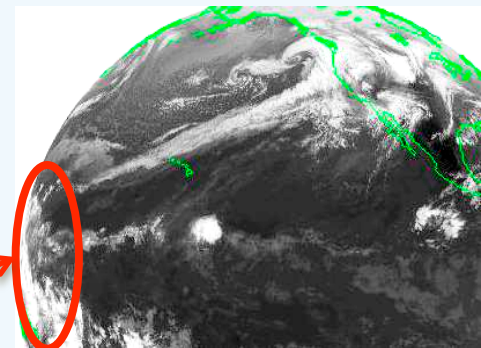
- **Challenges of future Western Water supply**  
(Western Water Assessment – Kristen Averyt)
- **Development of regional climate services**  
(Several speakers)
- **Anticipating and managing severe floods**  
(HMT and Atmospheric Rivers -Marty Ralph)



**Western Drought Impacts**



**1998 ENSO Impacts**



**MJO**

**Intraseasonal Impacts**

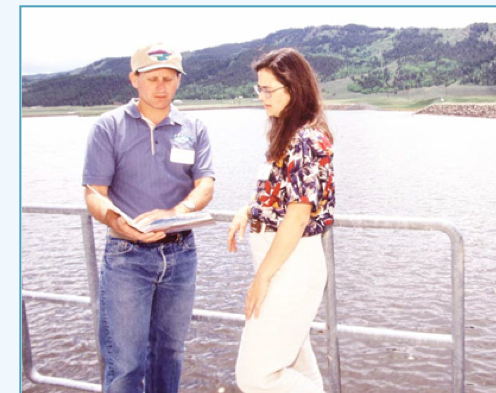


# Some common threads in what follows

- The importance of understanding user needs and the decision context.
- Sustained interactions are often vital.
- Decisions are made across a broad range of time scales, from weather to climate.
- Water – too much or too little – is often of crucial importance to decision-makers.



HMT-SE User Needs Workshop



Andrea Ray – field research to understand the decision context



# What you will hear, and what you won't

You *will* hear a sample of research-service presentations by:

- **Marty Ralph**      Research to Improve Services
- **Marty Hoerling**      Development of an attribution services capability
- **Kristen Averyt**      The Western Water Assessment
- **Roger Pulwarty**      National Integrated Drought Information System
- **Robin Webb**      Summary and Way Forward

You *won't* hear of numerous other important research-service activities by PSD and GSD.

*The good news:* Many of these other activities are covered in other oral presentations, poster presentations, and Division tours.